

NOVEMBER 1957

# data

GOVERNMENT RESEARCH AND DEVELOPMENT DIGEST

VOL. 12, NO. 11



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Snorkel Driving

In this issue . . .

NEW CHEMICAL BOMBER TO REPLACE B-52

# data

## DATA PUBLICATIONS

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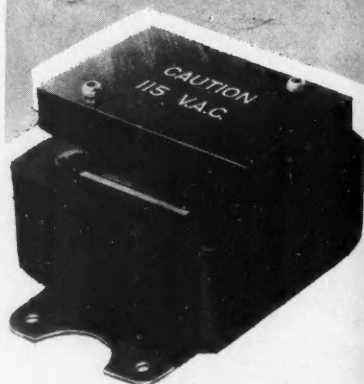
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## CONTROL ASSEMBLY

FOR THE

### J-4 Attitude Gyro



A new control utilizing ingenious internal shock mounts, a unique mechanical timing device and specially developed sensing relays. Black boxes, brain boxes and packaged electronics are typical products of Diaphlex, with more than 60 years of experience, dating back to early telephone and heating control equipment manufacture and design.

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## *This is our Beat*

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National War College

Air Research and Development Command

Navy Bureaus: Aeronautics, Medicine, Ordnance, Ships, Supplies & Accounts, Yards & Docks

Army, Navy & Air Force Offices of Information

Naval Ordnance Lab

Atomic Energy Commission

Naval Research Lab

Depts. of Agriculture, Commerce

Office of Naval Research

Congress

Pan American Union

Marine Headquarters

Small Business Administration

## *This month in Data*

### **NEW CHEMICAL BOMBER TO REPLACE B-52**

A new manned bomber, the WS-110, will soon be built to replace the B-52 in the SAC arsenal. The six-engined aircraft will fly at Mach 3 on new "exotic" chemical fuels. Range is expected to be intercontinental and ceiling may be as high as 100,000 feet. See page 6.

### **OPEN LETTER FROM ONR**

An Open Letter to Industry by ONR Chief, Rear Admiral Rawson Bennett on page 4, outlines future trends in R&D contracts and research policies of the Office of Naval Research.

### **NEW DOD DIRECTIVE**

New Department of Defense Directive (4105.48) on page 7, lays down overtime policy on unified procurement controls. Overtime to be figured by labor dollars and labor hours.

### **DATA COVER PHOTO**

Cover photo shows Pvt. M. D. Zachary driving a jeep through five feet of water at Ft. Chaffee, Arkansas. Army course in readying vehicles for fording rivers or in flooded areas includes snorkel driving.



#### **R/ADM. RAWSON BENNETT II**

*Rawson Bennett II was born June 16, 1905 in Chicago, Illinois. He was graduated from the U. S. Naval Academy in 1927. Returning to Annapolis in 1934 for postgraduate instruction in radio (electronic) engineering, he completed the course in 1936. Later he received the Master of Science degree in Electrical Engineering from the Univ. of Calif. In July 1939, he set up the technical program for the first Fleet Sound School, San Diego, Calif. As Director of the U.S. Navy Electronics Laboratory, San Diego, he completed the post war expansion of that Laboratory. In December 1955, he was appointed Chief of Naval Research, with the rank of Rear Admiral.*



#### **DEPARTMENT OF THE NAVY**

OFFICE OF NAVAL RESEARCH  
WASHINGTON 25, D. C.

IN REPLY REFER TO

1 November 1957

Dear DATA Readers:

Navy research and development has been a burgeoning program since the end of the war. The Chief of Naval Research is now responsible for the coordination of all research and development conducted by the various naval activities. However, the Office of Naval Research is mainly concerned with the support and administration of basic research. About four-fifths of our work involves contracts in which we support research in the basic sciences at universities and other academic and non-profit institutions. Development contracts in the ordinary sense are the province of the technical bureaus, who assume responsibility for an item of hardware for which they have special technical competence after research has proved out the principle of a new idea.

However, we do have a very limited number of contracts with industrial concerns for hardware in connection with our research program. These may be for research tools, such as research rockets and our



## WORDS TO READERS

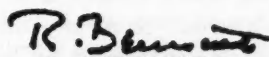
high altitude plastic balloons, or for what we call exploratory development. Examples of the latter would be the "flying platform," the one-man helicopter, and the new integrated aircraft instrument panel using flat plate television tubes. What we are interested in here are working models to test out our research ideas.

The criterion for deciding who is to get such contracts is not the size of the industrial firm. General Mills, Inc., for example, started the development of the plastic balloon, but later such small firms as Winzen Research, Inc., were given a chance to work on them.

Whether the product is a research tool or an exploratory model, we are primarily looking for aggressive, imaginative companies, large or small, willing to try something new with no chance of profit in the immediate offing.

The rewards of such contracts are perhaps intangible but worthwhile nevertheless. A success can firmly establish the reputation of a small firm or continue the high esteem in which a large firm is held by the public. This is in addition to the satisfaction of making a major contribution to our national defense effort. In this way the Navy and industry act as partners in a joint investment in the future of our country.

Industry and the military departments jointly face the serious problem of excessive development and production cost. By avoiding unneeded refinement, overly luxurious devices and unnecessary overhead, costs can be brought down. We must seek simple inexpensive solutions and not rest content with any workable equipment of undue complexity. We all must think more carefully and plan better before execution. If we do not, business and defense will suffer through the misapplication of a limited number of dollars.

  
R. BENNETT

Rear Admiral, USN  
Chief of Naval Research

## BRIEFINGS

### SAC 6-JET CHEM BOMBER, WS-110, PILOTED, MACH 3, TO OUST B-52:

New long-range "exotic fuel" bomber WS-110 (Weapons System 110) begins construction soon. Piloted aircraft will have six chemically fueled jet engines, each more powerful than J-75 and will fly at Mach 3 speeds at altitudes of 100,000 feet or more, according to USAF spokesman. Exterior appearance of WS-110 to closely resemble North American X-10, NAVAHO test vehicle, except much larger. Contractor for engines is General Electric. Contractor for airframe, as of this writing, still not finalized, but narrowed to either Boeing or North American with North American more likely choice.

Practically entire airframe will be built of steel and titanium. Managementwise, airframe contractor will be overall supervisor for WS-110 with main builders of the aircraft to be subcontractors of the prime. This is analogous to way Convair B-58 is built.

Designed to replace B-52 in Strategic Air Command, WS-110 will outperform everything AF now has including B-58. New Mach 3 aircraft will fill need for weapons system which can change course to seek out and destroy shifted or relocated missile sites or other moveable military objectives, something ICBMs cannot do. Also, AF finds pilot presently cheaper to use than expensive and admittedly still unreliable electronic automatic control systems and supporting ground equipment.

According to USAF source, small business firms will have opportunity to do much subcontracting on WS-110 and would do well to begin pitches to prime contractors now. We repeat, GE has engines, North American most likely on airframe — in fact NAA already has weapon system manager for WS-110 project. He is Jack J. Jones, Los Angeles Division, North American Aircraft.

### REPORT ON SMALL BUSINESS CONTRACTS:

Pentagon report issued by military contracts assist to SecDef shows one third of all government contracts fall within small business potential. Yet out of this \$6 billion in contracts \$2 billion is lost to prime contractors because small biz bidder bid too high, submitted incomplete bid, didn't have ability to carry out bid or just did not submit bid at all. Six out of every ten small biz contracts is with Army. Construction leads, followed by building supplies, textiles, clothing and equipage, subsistence, petroleum containers and handling equipment.

Small business awards were about evenly divided between advertised bids and negotiated contracts in FY 1957.

# NEW DOD DIRECTIVE

October 1, 1957

NUMBER 4105.48

ASD(S&L)



## Department of Defense Directive

SUBJECT Overtime Policy for Procurement Contracts

### I. PURPOSE

The purpose of this Directive is to effect an immediate, continuing and sharp curtailment in the use of overtime in the performance of all kinds and types of Department of Defense procurement contracts, including production, research and development, and construction. This Directive amplifies the provisions of ASPR 12-102 with respect to the use of and payment for overtime.

### II. RESCISSIONS

The following are hereby superseded and rescinded:

- (a) Memorandum addressed to the Materiel Secretaries by the Assistant Secretary of Defense (Supply and Logistics), dated May 16, 1957, Subject: Curtailment of Overtime; and
- (b) DOD Instruction 4105.48, Subject: Overtime Policy for Procurement Contracts, dated June 19, 1957.

### III. EFFECT UPON ASPR 12-102

To the extent that this Directive differs from the provisions of ASPR 12-102 with respect to overtime, this Directive shall govern.

### IV. GENERAL POLICY

- A. Department of Defense contracts shall be performed without the use of overtime, except as otherwise authorized in this Directive. Before authorizing overtime pay, either in the negotiation of contracts or during the performance of contracts, consideration shall be given to using other sources to obtain required supplies or services. The use of overtime pay as a regular part of employee compensation is contrary

to the principles of this Directive. This policy is applicable to all contracts entered into after the effective date of this Directive.

- B. Unless a determination has been made pursuant to paragraph V below, the cost of performance of overtime shall not be considered or allowed in the negotiation, repricing, or administration of negotiated contracts.
- C. Unless a determination as specified in paragraph V(i) or (ii) is made, no solicitation for bids or proposals shall require a delivery schedule which may be reasonably anticipated to necessitate overtime.

#### V. EXCEPTIONS TO GENERAL POLICY

Overtime pay may be authorized at Government expense only when the Secretary of a military department or his designee determines in writing that such overtime ----

- (i) is necessary to meet delivery or performance schedules, and such schedules are determined to be extended to the maximum consistent with essential military objectives; or,
- (ii) will result in lower over-all cost to the Government, as well as reduced current payments; or,
- (iii) is necessary ----
  - (A) to eliminate specific production bottlenecks which cannot be eliminated in any other way;
  - (B) to cope with emergencies resulting from accidents, or natural disasters;
  - (C) to perform tests, industrial processes, and laboratory procedures which are continuous in nature and cannot reasonably be interrupted or otherwise completed.

#### VI. APPROVAL OF OVERTIME

- A. When determinations are made pursuant to paragraph V above, an authorization to perform overtime shall be included in each contract other than firm-fixed price type either at the time of execution, by amendment, or by written notice to the contractor, as may be appropriate.

- B. Determinations made pursuant to paragraph V(iii) above, shall be supported by written request of the contractor. The contractor's request shall specify the reasons why overtime is (or has been) necessary, and shall indicate (i) the specific operations and class of personnel which will be (or have been) affected, (ii) the estimated (or actual) number of hours and cost of overtime to be (or which have been) required for each operation and class of personnel, and (iii) the estimated (or actual) period of contract performance during which overtime will be (or was) required.
- C. Contract provisions or determinations approving overtime shall be limited strictly to the minimum required for the accomplishment of specific work, and shall specifically indicate (i) the operations and class of personnel affected; (ii) the location of the plant or other facility and the department or other subdivision thereof; (iii) the maximum number of hours and cost of overtime authorized and (iv) the period of time during which the authorization is effective.
- D. Contract provisions and notices when on a prospective basis, shall provide for review and alteration by the Government upon a unilateral basis. Authorizations shall be reviewed periodically after they have been in effect for a reasonable period of time not exceeding 60 days to insure that the reasons upon which the determinations were based continue to be valid. Contract provisions shall provide for equitable adjustment pursuant to the Changes clause in the event of reduction or discontinuance of overtime.
- E. Authority to make determinations and approve the performance of overtime may be delegated to any officers or employees of the military departments, but only to the extent of determinations in connection with or approvals of overtime (1) under V(ii) and V(iii) above and (2) amounting to not more than 2% of the total labor-hours or labor-dollars under any Department of Defense contract.
- F. Overtime pay for certain indirect labor employees whose duties are essential for administration or for protection and maintenance of plant and equipment, such as standby plant protection, operation of utilities, required maintenance of an emergency nature, or accounting, may be allowed or considered



on the same basis as other indirect costs providing (i) a written request is made pursuant to B. above, and (ii) the amount thereof is reasonable and allocated on a pro rata basis to commercial as well as Government work. Such overtime pay shall not be subject to paragraphs V or VI.E. and when approved under this paragraph, such indirect labor shall be excluded from the base of total labor-hours or labor-dollars. Other indirect labor overtime, normally associated with production activities, such as engineering, supervision, or inspection, shall be subject to paragraphs V and VI.E. above.

- G. Overtime may be considered and approved on a plant-wide basis when it is determined to be impracticable on a contract-by-contract basis.

## VII. DEPARTMENTAL COORDINATION

- A. In the absence of evidence to the contrary, personnel within a military department authorized to approve performance of overtime may rely upon the representation of a contractor that such approval will not affect the performance of, or payments in connection with other Department of Defense contracts.
- B. 1. Where it becomes known that two or more military contracting activities have current contracts at a single facility so scheduled that the authorization of overtime by one contracting activity may affect the performance of, or payments in connection with contracts of another activity, the contracting activities involved shall agree upon the appointment of one of such activities as their representative to make determinations with regard to overtime pay for all Department of Defense activities affected.
2. If agreement upon appointment of a representative is not reached within a reasonable time, the Assistant Secretary of Defense (Supply and Logistics) shall be requested to appoint a representative.
3. Contractors shall be notified in writing when a representative has been agreed upon or appointed.
4. Determinations made by such representatives shall be made in accordance with Sections V. and VI. E. above and shall be binding upon all military contracting activities concerned. Representatives shall seek agreement acceptable to all military departments involved wherever practicable in advance of making determinations, and, in any event representatives shall furnish all contracting activities involved with copies of determinations made under this Directive.

VIII. ACTION WITH RESPECT TO EXISTING CONTRACTS

- A. Existing Department of Defense contracts under which overtime work is authorized, or in which it is known that the contract price includes a factor for overtime, shall be reviewed without delay. To the extent that such overtime work does not fall within the exceptions set forth in paragraph V, above, and savings to the Government may be expected, the following action shall be taken.
1. Contractors shall be requested to reduce or eliminate payment of overtime wages to the maximum extent possible, and, where contractually appropriate, authorization for overtime shall be withdrawn.
  2. Where appropriate, performance and delivery schedules shall be extended by (i) supplemental agreement, (ii) change order (if permitted by the contract), and adjustments shall be made in authorizations for overtime or the contract price.
- B. Reviews referred to in paragraph A above shall include consideration of major first-tier subcontracts, particularly those under prime contracts providing for price redetermination, escalation, or incentives; or cost-reimbursement, time and material, and labor-hour type contracts.

IX. EFFECTIVE DATE

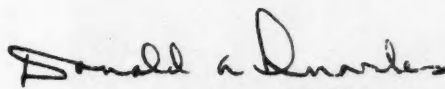
This Directive is effective immediately.

X. IMPLEMENTING INSTRUCTIONS

The military departments shall disseminate the provisions of this Directive and shall furnish a copy of each implementing directive and instruction issued at all levels to the office of the Assistant Secretary of Defense (Supply and Logistics) within 30 days after the date of this Directive. All implementing instructions shall be made effective upon receipt.

XI. RECORDS

Records will be maintained sufficient to enable the military departments to provide this office, upon request by separate action, with information concerning the progress made in the objectives of this Directive.

  
Deputy Secretary of Defense

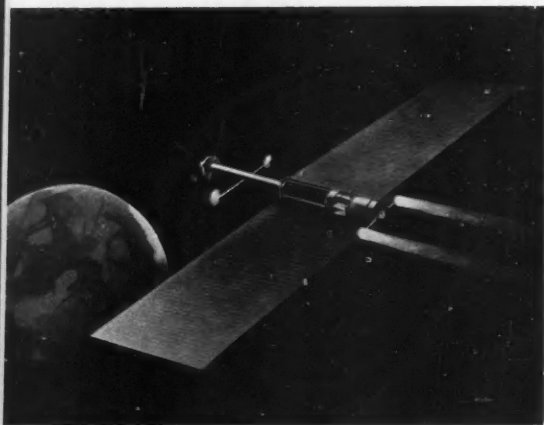
## AIR & SPACE

### 508. ARMY/NAVY PANEL TV COCKPIT AVAILABLE:

New flight-tested cockpit panel made available to commercial airlines by Army and Navy presents TV view of outside world to pilot under all weather conditions. Dubbed ANIP (Army/Navy Instrumentation Program), it consists of TV screen 20 x 11 inches fed by an electronic digital computer; gives pilot three-dimensional view for safer aircraft control. New computer feeds pilot steady readings of airspeed, mach number, altitude and climb rate, computation for weight, fuel, time and distance under all conditions. ANIP has been thoroughly tested and little remains before its full scale operational use by commercial and military aircraft. /// Pentagon OPI 1014/

### NEW ROCKET RESEARCH FACILITY BY NACA:

509. New rocket research facility permits scientists to use practical-sized rocket engines to utilize new high energy rocket propellants. Expenses are reduced by using low-cost fuels during initial studies before investigations are made with scarce, expensive fuels. Tubular steel frame of test stand holds a 20,000-pound thrust rocket, and elaborate instrumentation provides means for recording data during tests. The rocket jet is directed downward into treatment duct where harmful exhaust is removed and engine noise is silenced. Both functions are accomplished by a scrubber silencer using a high pressure water spray. /// NACA 1007 /

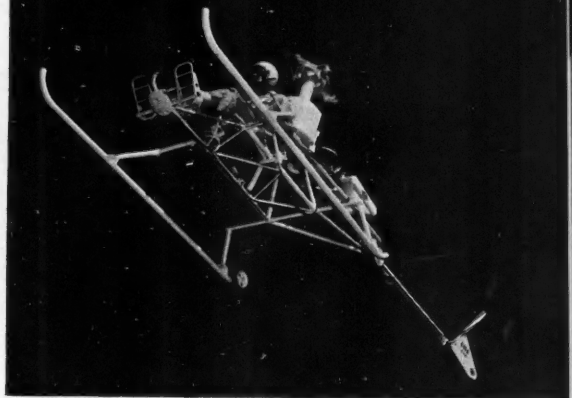


### "PROJECT SNOOPER" AN ION-PROPELLED VEHICLE

*SNOOPER as conceived by a group of North American Aircraft engineers, is an idea for the possible reconnaissance of the solar system by unmanned, nonreturnable space vehicles weighing less than two tons. SNOOPER's low thrust ion motor would propel the vehicle through space, telemetering information back to observers. Power for approximately one year would come from the nuclear plant used to power the ion motor.*

### "GIZMO" ULTRA-LIGHT HELICOPTER

Goodyear Aircraft presents model of the new ultra-light helicopter, speeds up to 55 knots. Known as "GIZMO," it offers simplicity of design and low maintenance cost combined with positive flying qualities. Suitable as a courier, liaison, observation or command vehicle, GIZMO's open construction permits easy access to all parts.



### 510. ATMOSPHERIC DUST MAY ALTER MISSILE BEHAVIOR:

Experiments at Cornell Aeronautical Lab indicate small amounts of atmospheric dust may affect reentry of ICBM. Hypersonic shock tunnel tests on blunt-nosed models show that dust particles accelerated at high speeds are reflected back from surface of missile into air stream, creating a pointed cone ahead of missile. Although the cone collapses immediately, it is enough to intersect and disrupt the normal shock wave.

/// Cornell Aeronautical Lab /

### 511. DEVICE INCREASES AIRCRAFT RANGE:

A thermometer device to help aircraft increase range and save fuel has been developed for ARDC by the Armour Research Foundation. This "vortex thermometer" assists aircraft to locate jet air streams by giving immediate readings on temperature changes. Planes using jet streams from Tokyo to Honolulu have reported up to 1200-pound fuel savings.

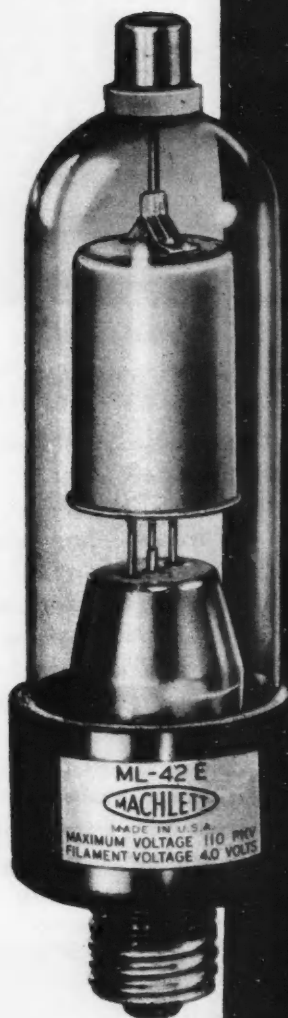
/// ARDC 1004 /

### 512. TURBOJET OPERATING AT MACH 4 PLANNED:

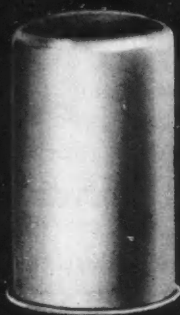
NACA scientists are working on a turbojet capable of 2600 mph. They are concentrating on inlet and exhaust systems essential for any planes flying at Mach 4. The engine may have only a three-stage compressor with turbine blades of special alloys. High temperatures likely to cause many modifications. Temperatures that affect engine bearings and seals present another unsolved problem. Experiments to date show smaller combustion sections to be more practical for these faster and hotter turbojets.

/// NACA 1007 /

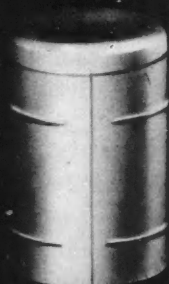
## *Electron*



NEW  
ANODE



OLD  
ANODE



The deep-drawn  
one-piece molybdenum  
anode replaces  
the conventional  
welded anode.



# FANSTEEL



on **MAGIC**

## **depends on METALLURGY**

And as the science of metallurgy advances so does the electronic tube.

Take this X-ray valve tube, for example. Moly for a long time was known as the ideal anode material, but it had to be formed and welded as a two-piece construction.

Now because the Fansteel metallurgist puts more ductility and more uniformity into the metal the anode is *deep drawn* with these benefits:

- Fewer tube rejects
- Easier assembly
- Quicker and more thorough outgassing
- 180° flared edge
- Wall and end thickness uniform
- No grooves
- No welds

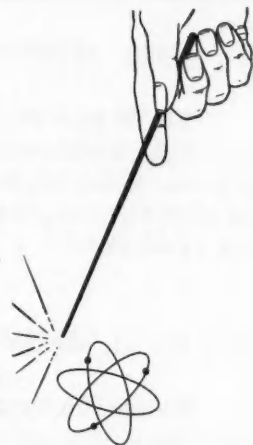
Metallurgical *progress* in refractory metals is an established habit at Fansteel. Try us for difficult problems in molybdenum, tungsten, tantalum and high density metals.

*The case history repeated here is typical of the news found in Fansteel Metallurgy, a free journal of information. Ask to be put on our mailing list—all we need is your name and business address.*



# **FANSTEEL METALLURGICAL CORPORATION**

**NORTH CHICAGO, ILLINOIS, U. S. A.**



## COMMUNICATIONS / ELECTRONICS

### 513. HIGH VACUUM LAB REVEALED:

USAF has revealed a vacuum facility to be used for research on ultra-high altitude weapons systems, friction studies on mechanical parts in ionospheric environments, radiation tolerance studies and on trials of human protective equipment. It can also be used for electron tube research. /// ARDC 264-57 /

### 514. BATTLEFIELD AUTOMATION:

Research by Continental Army Command shows that electronic data processing will be carried out in the battle zone by 1970. An officer will use a computer to determine plans before combat, then predict probable results. The computer will assemble information on staff estimates, firepower, supplies and removing of non-combat troops, thus improving reaction time between front and rear units.

/// Signal Magazine 09-65 /

### 515. NAVAL WEATHER REPORTS BY TV:

WEATHERVISION, special closed circuit TV system for briefing pilots recently unveiled at Lakehurst Naval Air Station, was developed by Dage TV division of Thompson Products. Makes possible simultaneous briefing of several Naval squadrons. Seven other stations will be installing WEATHERVISION soon. /// Naval Aviation News 10-36 /



#### SPUTNIK SIGNALS RECORDED

*Vitro engineers made contact with Russia's satellite and recorded the beeps for five minutes before the signals were lost. They played their magnetic tape recording into a cathode ray oscilloscope and made a photograph of the signal as it appeared on the scope screen.*

516. NBS INVESTIGATES WAX ELECTROLYTE BATTERY:

Low current punched cell battery has been developed by NBS, using an electrolyte of solid polyethylene glycol. The 25-cell unit is less than an inch long and has an electromotive force of 37.5 volts. Shelf life is up to three years. Applications include grid bias voltage for tubes and maintenance of capacitor charges. /// NBS 0927 /

517. COOLING OF SHIPBOARD ELECTRONIC EQUIPMENT:

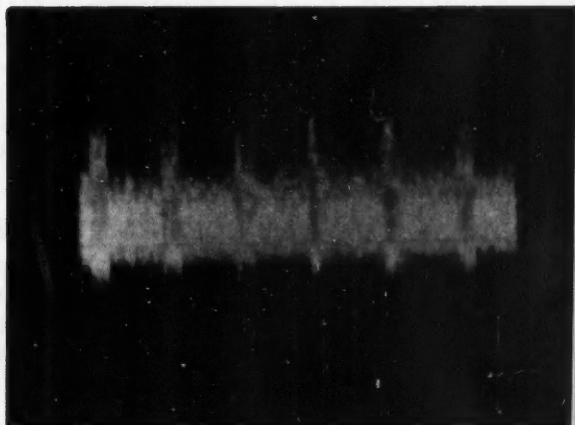
NBS research indicates shipboard electronic equipment can be better cooled by using a closed forced convection system, employing an intermediate coolant and a heat exchanger and using water as the ultimate heat sink. System removes 72 percent of the heat in cabinet. /// NBS 1021 /

518. TEMPERATURE ACCELERATION INDICATOR CUTS LOSSES:

Lycoming division of Avco has developed a temperature acceleration indicator for use in jet engine tests to cut down losses due to any bearing failures. New gadget sounds an alarm on acceleration of the normal engine temperature. Now being used in production engine testing, it can also be utilized in connection with steam turbines, gasoline engines or helicopter transmissions and gear boxes. /// Avco-Lycoming /

**SPUTNIK SIGNALS PHOTOGRAPHED**

The bursts of higher amplitude signals, spaced one third of a second apart in the picture, are the signals transmitted from the Soviet satellite. These signals may contain meteorological, radiation and other data. The Vitro photographs are now undergoing analysis to determine the nature of the intelligence that the miniature moon is transmitting to earth.



# CONSTRUCTION

## 519. WEST COAST ICBM RANGE SPECULATION CONFIRMED:

Speculation that South Pacific ICBM-IRBM missile range would be built and placed in operation soon has been confirmed by ranking AF official. DATA in October issue reported hundred million dollar AF activity at Camp Cook, Calif., to house training units for ICBMs, giving rise to speculation that AF would construct South Pacific range. ///D/

## 520. CONSTRUCTION AT NERO LEVEE:

U. S. Army Engineer District, New Orleans, Corps of Engineers, Foot of Prytania St., New Orleans, La. Construction at Nero Levee, including restoration and concrete sloping of pavement. Plaquemines Parish, La. Job IFB CIVENG 16-047-58-67B. Bid during Nov. 1957.

## 521. VICKSBURG LEVEE:

U. S. Army Engineer District, Vicksburg, P. O. Box 60, Vicksburg, Miss. Construction of Arkansas River Bank... including stabilization works, levee degrading, standard revetment and earth dike construction. Item DR-67.5-R, Kimbrough, Ark. Job CIVENG 22-052-58-37-B. Bid opening Oct. 29, 1957.

## 522. TUTTLE CREEK DAM, KANSAS CITY:

U. S. Army Engineer District, Kansas City Corps of Engineers, 1800 Federal Office Building, Kansas City, Mo. Construction of spillway at Tuttle Creek Dam and Reservoir. Work consists of concrete forming of Weir Spillway Structure. Job IFB 58-25. Bids opening Dec. 12, 1957.

## 523. FAMILY HOUSING UNITS AT COTTONWOOD, IDAHO:

Procurement Office, Geiger Field, Spokane, Wash. Construction of 27 family housing units including utilities, landscaping, etc. Vicinity of Cottonwood, Idaho. Design to be of contractor selection in conjunction with AF design. Job IFB 45-614-58-16B. Bid opening Nov. 26, 1957.

## 524. ION GENERATING TUBE FOR AIR CONDITIONING:

AEC has recently put another low level radioactive sealed source on the market which can be used without licensing. An ion generating tube containing about 50 millicuries of hydrogen 3 (tritium). The tube is designed for use in air conditioning. /// AEC 1016 /

## 525. LONG RANGE NUCLEAR PROPELLED AIRCRAFT PLANNED:

Lockheed is undertaking development of nuclear troop and cargo transports capable of flying nonstop from San Francisco to Manila on easily stored nuclear fuel, with a logistical payload of 50 tons or more. A propjet is considered most efficient for use with nuclear fuels and has the further advantage of short takeoffs and landings. Aircraft would be roughly similar to the C-130 combat transport with a single reactor. Main problem is weight of shielding for reactor and crew. "Divided" principle — shielding distributed around crew compartment and reactor — might solve weight problem. /// Lockheed 1003 /

## 526. NEW REACTOR IN OPERATION IN IDAHO:

Organic Moderated Reactor Experiment (OMRE) is in operation at AEC's Idaho test site. Designed to show way for economic nuclear power for civilian use, OMRE uses organic compound terphenyl as a moderator and coolant. OMRE can produce 16,000 KW of power from heat exchanger. /// AEC 0927 /

## 527. KAISER GETS AEC CONTRACT:

AEC has awarded Kaiser Engineers, Oakland, a contract for design of natural uranium graphite moderated gas cooled nuclear power plant of 40,000 KW capacity. ACF is subcontractor. /// AEC 1017 /

## 528. NOL STUDIES NUCLEAR RADIATION SHELTER SHIELDING:

Naval Ordnance Lab studies probe best construction methods to protect personnel in structures from blast and thermal attack effects. Many lessons already learned. /// NOL 09 /



## LOGISTICS / MATERIALS

### 529. DEEP FREEZE SKIS:

First airplane ever landed at South Pole came close to being first ever stranded there. Polyethylene surfaced skis had frozen fast and pilot had to fire his 15 JATO bottles to take off. Now Naval aircraft are being equipped with skis surfaced with DuPont's Teflon, tetrafluoroethylene resin, for use in DEEP FREEZE III. Teflon, plastic with the lowest coefficient of friction for any known solid, has immunity to temperature extremes, permits free takeoffs even under weight of giant planes. Teflon also fills host of other uses.

/// DuPont 10 /

### 530. TINY PERMANENT MAGNETS OF ALLOY WIRE:

A National Bureau of Standards technical report gives details on wire magnets as fine as human hair. Drawn from CUNIFE, a nickel-copper-iron alloy, magnets can be made from cold drawn fine wire which does not require sintering or casting. Even worked cold, loss of magnetic properties can be regained by baking or heat treatment for larger wire sizes. NBS research demonstrates that Cunife wire can be drawn to .005 inch and still retain satisfactory magnetic properties.

/// NBS Tech Rept 2157 /

### 531. MARTYR METAL SOLVES OXIDATION PROBLEMS:

Lockheed Aircraft describes a new cadmium coating process for aircraft parts which resists corrosion and weakening. Cadmium coating is self sacrificing, permits itself to oxidize rather than the part it protects. Coating is said to last as long as life of part protected. It is now being used commercially for F-104 STARFIGHTER parts, including landing gear components, bolts, fittings and fasteners.

/// Lockheed 1004 /

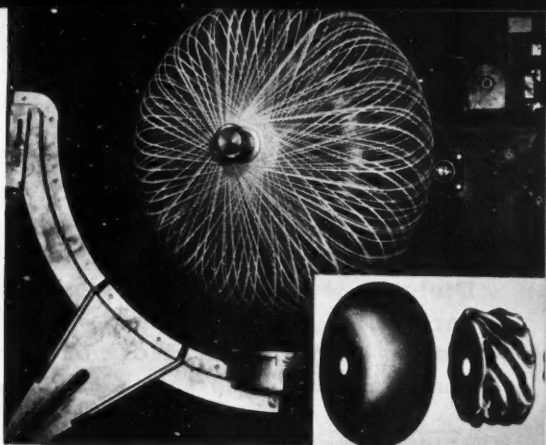
### 532. NACA TESTS HIGH ENERGY FUELS:

Some fuels including powdered boron, boron hydrides and other boron-hydrogen compounds have already been tested by NACA's Lewis Flight Propulsion Lab and show encouraging results. Main drawback is high cost of manufacture and toxicity of boron engine deposits which reduce efficiency.

/// NACA 1007 /

### NEW AIRPLANE TIRES

Fairchild Aircraft engineers have developed a continuous high tensile nylon cord to provide extra support at points where stress is expected. Other advancement is the deflating tire. Completely collapsible, the deflated tire when not in use takes one eighth the space of conventional aircraft tire, giving additional cargo space in landing gear compartment.



### 533. TITANIUM UNDER STUDY FOR ELECTRONIC APPLICATIONS:

The new microminiature 6BY4 tube of titanium and ceramics points way to greater use of titanium in electronic and other industries. Useful thermal coefficient of expansion, excellent degassing properties and ability to hold oxygen and hydrogen in stable compounds plus low emission properties of titanium recommend it for wider use. Titanium will see service in capacitors, wave guides and certain antennas for Navy.

///Electronic News/

### 534. EFFECTS OF RUBBER COMPOSITION ON POLYETHYLENE:

Tensile strength and elongation of polyethylene generally are not affected seriously by contact with rubber compositions. Polyethylene will be affected adversely by rubber formulations in which hydrocarbon or ester plasticizers "bleed" to the surface.

/// Commerce 1002 /

### 535. SINGLE MANAGER PLAN:

Single manager concept offers promise of significant gains in area of logistics. Plan calls for assigning wholesale supply responsibility to one military service for itself and other services. Secretary of designated service is single manager, heads cataloging, standardization, requirements determination, procurement, production inspection, storage, distribution, transportation and maintenance. At present each service has own supply system. Under new system, each service computes own requirements but the single manager collates them and determines the net procurement requirements. Plan is not finished product but should prove valuable in cutting logistic costs in services. /// Army Info 11-13/

## ORDNANCE

### 536. LOCKHEED AWARDED \$62 MILLION FOR POLARIS WORK:

A \$62.1 million contract for continued development of Navy's fleet ballistic missile, POLARIS, has been awarded to Missiles System Division of Lockheed, Navy announced Oct. 23. Lockheed received earlier \$20.5 million contract for initial research, development and testing of POLARIS. Work on missile is being done at Lockheed's Sunnyvale and Palo Alto, Calif., facilities.

Major firms working with Lockheed on POLARIS program include Aero-Jet General, General Electric, Westinghouse and Sperry Gyroscope. Westinghouse previously had been awarded \$10 million contract for development of experimental launching system and GE got contract for \$1.5 million on fire control system.

/// Pentagon OPI 1023 /

### 537. LATHE MACHINES EXPLOSIVES SAFELY:

Naval Ordnance Lab has semiautomatic, remote controlled lathe for machining of high explosives. Operator observes machining via closed circuit TV and controls operations at a panel behind a two foot concrete wall. Controls permit operator to change speeds, alter feed rates and regulate number of passes. New lathe permits safe machining of high explosives into intricate shapes at close tolerances.

/// NOL Report 09-5 /



#### MINE PLANTER LAYS ANTITANK MINEFIELD AUTOMATICALLY

*Mechanical mine planter developed by the Army Engineer R&D Lab is shown laying an anti-tank mine field. Mines are automatically armed and planted at predetermined rate. Only tractor operator is required for operation, making possible tremendous saving in man hours and labor compared to old method of digging individual holes for each mine by hand.*

### Joining the Fleet This Year — 1957 Ship Delivery Schedule

Note: This listing includes six ships completing conversion and 32 new construction hulls

USS Mauna Kea (AE 22)	USS John Willis (DE 1027)	USS Thomas J. Gray (DE 326)	USS Adroit (MSO 509)
USS Albemarle (AV 5)	USS Van Voorhis (DE 1028)	USS Ramsden (DER 382)	USS Stalwart (MSO 493)
USS Midway (CVA 41)	USS Lester (DE 1022)	USS Mills (DER 383)	USS Swerve (MSO 495)
USS Ranger (CVA 61)	USS Evans (DE 1023)	USS LCU 1608	USS Sturdy (MSO 494)
USS Manley (DD 937)	USS Hartley (DE 1029)	USS LCU 1609	USS Advance (MSO 510)
USS Davis (DD 937)	USS Bridget (DE 1024)	USS Monticello (LSD 35)	USS Affray (MSO 511)
USS DuPont (DD 941)	USS Bauer (DE 1025)	USS Suffolk County (LST 1173)	USS Bittern (MHC 43) delayed from 1956
USS Jonas Ingram (DD 938)	USS Joseph K. Taussig (DE 1030)	USS Grant County (LST 1174)	USS Seawolf, SS(N) 575
USS Bigelow (DD 942)	USS Newell (DE 322)	USS York County (LST 1175)	USS YMP 3

/// 10-13 /

ALL HANDS

#### 538. CARRIER KITTY HAWK TO HAVE GUIDED MISSILES:

New carrier KITTY HAWK (CVA-63) will be first Navy ship armed with TERRIER missiles. Due to installation of TERRIER equipment and special facilities for aviation fuel, completion of 60,000 ton vessel may be delayed to 1959.

/// Pentagon OPI 1009/

#### 539. FIFTH NUCLEAR SUB LAUNCHED:

Navy announced the launching of its fifth nuclear powered sub, USS SARGO (SSN 583), at Mare Island Naval Shipyard, Vallejo, Calif. SARGO is the first nuclear powered sub constructed on the Pacific Coast and marks the start of Navy efforts to acquire sub building facilities on both coasts.

/// Vitro 0910/

#### SARATOGA LAUNCHES FIGHTER

F3H McDonnell DEMON is catapulted from the USS SARATOGA (CBA-60) during carrier qualification operations near Guantanamo Bay, Cuba. The massive size of the angled deck carrier is very apparent from this low angle photo.



## OPERATIONAL REQUIREMENTS

### 540. TURBINE NOISE SUPPRESSION:

Increasing size of turbojets and more use of afterburners has greatly increased sound problem at airports. While problem can be solved in engine test stands, operational use of jet aircraft makes life of citizens near airports hard. This has become serious public relation problem. Any solution would be of great value. /// NIC 689 /

### 541. HIGH TEMPERATURE AIRCRAFT TIRES:

Services need aircraft tires with good resilience, resistance to heat from -65 degrees (F) to +550 degrees (F) that can deform 35 percent under load yet bounce back with good ground flotation properties, no flat spots. Such tires must also withstand rotational speeds to 275 mph without failure. Treads should be long-wearing, have anti-skid properties. /// NIC 678 /

### 542. INSULATION NEEDS:

Insulation is needed having a dielectric constant of one over a wide temperature range. . . from -65 degrees (F) to +535 degrees (F) as insulating material for electronics. Insulation having good machining qualities over same range desired. Insulation should have property of conducting heat to a heat sink. /// NIC 645 /

### 543. HEAT-RESISTANT AIRCRAFT ENGINE MATERIALS NEEDED:

NACA expresses need for gas turbine materials which retain strength at 2000 degrees (F), ramjet materials for temperatures of 3000 degrees (F) and nuclear rocket materials for 5000 degrees (F). Without such materials, propulsion problems in these temperature ranges cannot be solved. Nickel, columbium and tungsten seem to offer best chances of research breakthrough, but much still has to be done. Interesting process of locking the atomic structure of the materials in place with refractory particles that don't melt shows that deformation can be prevented. Mixtures of small amounts of finely divided aluminum oxide in nickel has prove promising in improving heat strength. Ideas on solving this problem would be welcomed by NACA. /// NACA release 1007 /



## MAGAZINE PREVIEWS & REVIEWS

### MISSILES & ROCKETS (Available Nov. 4, 1957)

Human factors in space flight is the theme this month. Also featured is an exclusive roundup of Soviet space flight advances and a history of manned rocket aircraft.

### SIGNAL (Available Nov. 15, 1957)

Article by W. T. White and B. H. Mandell on "SPARROW I, Epoch in Missilry." Other articles include "Electronics in New Weapon Systems," by R/Adm. C. F. Horne, USN.

### NEWSWEEK (Oct. 21, 1957)

"Satellites and Our Safety" (cover story) discusses Russian satellite; gives roundup of U. S. and Russian nuclear bombs, military missiles and space vehicles. "Periscoping the Nation" says top Government officials were tipped on Soviet plans and progress last May by AF intelligence and CIA. "Periscoping the World" says East German nuclear experts just back from Moscow report Russia is now building prototype of atom powered airplane. Business Trends says Soviet satellite makes it certain that Defense spending will go up. SecDef McElroy's demands for money for any project will be hard to turn down.

### TIME (Oct. 21, 1957)

"The Race to Come" tells reaction various Administration and military officials had to Russia's successful launching of satellite. "Project VANGUARD, Why It Failed to Live Up to Its Name" tells why U. S. earth satellite program was turned over to Navy; says interservice rivalry did not slow up project. Blames Administration lack of imagination.

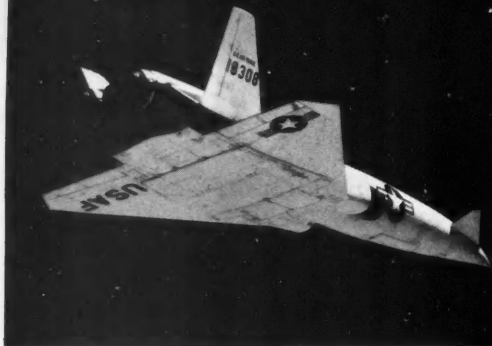
### LIFE (Oct. 21, 1957)

"The Feat That Shook the Earth" tells about Russian earth satellite; quotes critics' remarks concerning reasons U. S. is behind Russia in launching satellite, including article by Dr. C. C. Furnas; pictures of Army antenna at Ft. Monmouth, scientists at Minitrack station near Washington, cutaway of U. S. satellite, equipment for U. S. satellite test at Patrick AFB, scientist in "space" suit at Litton Industries.

## DEADLINE DATA

### NORTH AMERICAN X-10 TEST VEHICLE

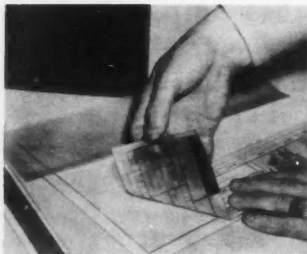
The North American X-10, test vehicle for the NAVAHO SM-64, was a pilotless flying laboratory. The half billion dollar SM-64 project was summarily junked by the USAF, a victim of DOD defense slashing. However, the USAF has now decided to go ahead with new Chemical Bomber WS-110 which engineeringwise will use many features of the X-10.



### DOPPLER RADAR SYSTEM UNVEILED:

Details of the AF new Doppler aircraft radar navigation system have been released by the Air Research and Development Command. The system makes it possible to plot a course anywhere on earth, constantly compute aircraft speed, drift and destination distance. Accuracy of system permits piloting aircraft within a 12-mile circle of destination. Called ERDR (Earth Rate Directional Reference), principle is that radio waves, like sound, have higher pitch approach stationary point than when receding. Difference in frequency used for computations. ///ARDC 1001/

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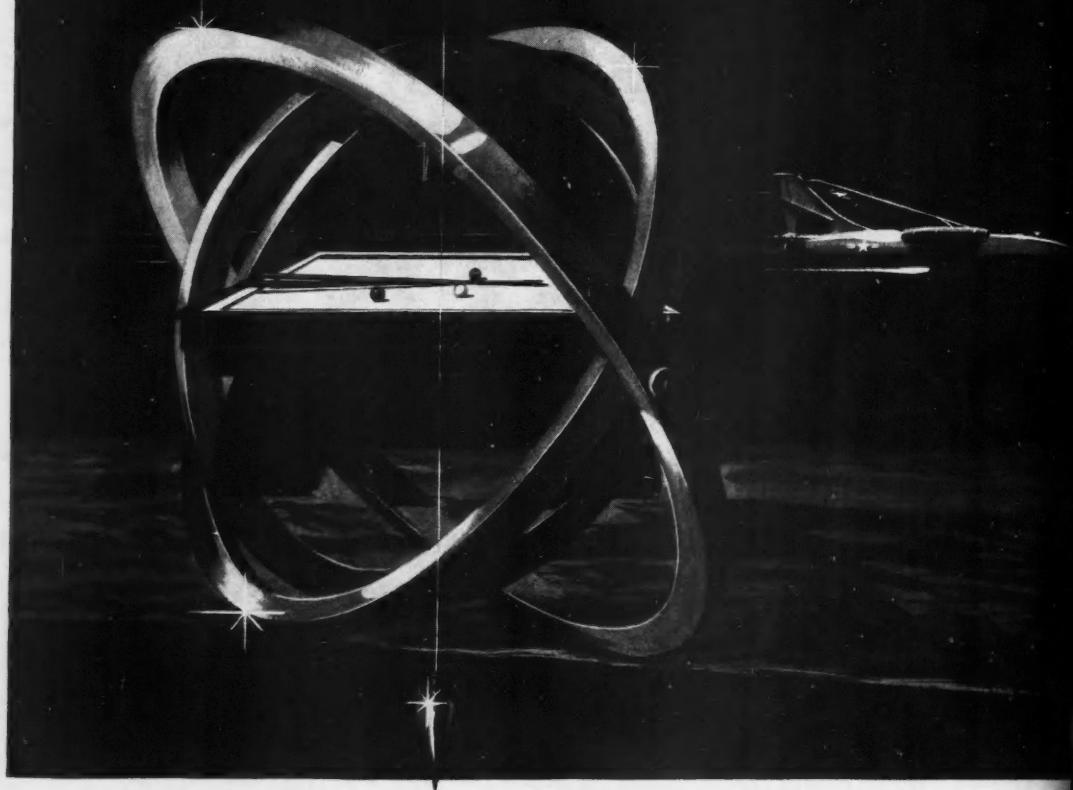
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